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Adrian Robert Leigh Travis

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EXAMINER

CARTER III, ROBERT E

ART UNIT

PAPER NUMBER

2629

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/559,891	<b>Applicant(s)</b> TRAVIS, ADRIAN ROBERT LEIGH	
	<b>Examiner</b> ROBERT E. CARTER III	<b>Art Unit</b> 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

The RCE amendment filed on 01/22/2009 has been entered and considered by the Examiner.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 12 have been amended to recite the limitation  
“wherein the tapered waveguide has a tapered cross-section in a direction of propagation of the injected light”

However, the light does not propagate through the waveguide in a straight line, but rather bounces back and forth. Therefore the taper of the waveguide cannot possibly follow the direction of propagation of the light. It is possible for it to follow some average or net path of the light, but even then the light exits the waveguide at a 90 degree angle to the direction of the taper, so the average or net path through the waveguide will still not be exactly in the direction of the taper.

For the purposes of examination the Examiner assumes that the applicant means the average direction of the light propagating through the waveguide.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 5, and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Irwin (US Patent # 4,978,952).

As for claim 1, Irwin teaches:

*An illuminator system (Fig. 2) for a flat-panel display (Fig. 2, #30), comprising:*  
*a tapered waveguide (Fig. 2, #20) co-extensive with the display,*  
*a plurality of light sources (Figs. 2, 6, #25) each arranged to inject light at a different angle into an edge of the waveguide (Fig. 3, LEDs 25 are clearly injecting light at different angles), wherein light injected from each of the light sources emerges at different positions on a face of the waveguide based on the injection angle corresponding to each light source (Fig. 3, the light from the bottom LED clearly emerges at the top of the waveguide, and the light from the top LED clearly emerges at the bottom of the waveguide), and*  
*means (Fig. 6, #51, 52, 53, 54) for scanning the emerging light associated with a light source onto a portion of the display (Col. 5, lines 16-32), wherein a position of the*

*portion of the display corresponds to the position on the face of the waveguide at which the light emerges* (Fig. 2, the waveguide clearly projects the light from a particular LED onto a portion of the display corresponding to the position on the face of the waveguide at which the light emerges),

*wherein the tapered waveguide has a tapered cross-section in a direction of propagation of the injected light* (Fig. 3 clearly shows the light propagating in direction toward the top of the waveguide 20, which is the same direction in which the waveguide tapers).

As for claim 2, Irwin teaches:

*An illuminator system according to claim 1, in which each light source comprises one or more addressable rows of elements* (Figs. 2 and 3 Fig. 6 clearly shows 5 rows of RGB diodes, Col. 5, lines 3-8), *and the scanning means includes a circuit* (Fig. 6, #51, 52, 53, 54) *for addressing these rows of elements.*

As for claim 5, Irwin teaches:

*An illuminator system according to claim 2, in which the one or more rows of elements comprises a plurality of LEDs* (Col. 5, lines 3-8).

As for claim 7, Irwin teaches:

*A display comprising an illuminator system according to claim 1, used as a backlight, and a flat-panel modulator over the-waveguide* (Fig. 2, Col. 6, lines 57-63).

As for claim 8, Irwin teaches:

*A display according to claim 7, in which the modulator is a liquid-crystal display (Col. 6, lines 64-66).*

As for claim 9, Irwin teaches:

*A display according to claim 2, in which a scanning addressing circuit (Fig. 6, #51, 57, 58) is synchronized with the row addressing circuit (Col. 8, lines 6-10).*

As for claim 10, Irwin teaches:

*An illuminator system according to claim 1, wherein the waveguide is geometrically tapered (the waveguide of Figs. 2 and 3 is clearly geometrically tapered).*

As for claim 11, Irwin teaches:

*An illuminator system according to claim 1, wherein the waveguide is optically tapered (the waveguide of Figs. 2 and 3 is clearly optically tapered).*

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 2629

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 12-13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Sakaguchi et al. (US Publication # 2002/0030772).

As for claim 12, Irwin teaches:

*A method for illuminating a flat-panel display (Fig. 2, #30), comprising:*

- a) injecting light from a light source of a plurality of light (Figs. 2, 6, #25) sources at an injection angle into an edge of a tapered waveguide (Fig. 2, #20) that is co-extensive with the display (Fig. 3, LEDs 25 are clearly injecting light at different angles), wherein the injected light emerges from a position on a face of the waveguide based on the injection angle of the light source (Fig. 3, the light from the bottom LED clearly emerges at the top of the waveguide, and the light from the top LED clearly emerges at the bottom of the waveguide), wherein the tapered waveguide has a tapered cross-section in a direction of propagation of the injected light (Fig. 3 clearly shows the light propagating in direction toward the top of the waveguide 20, which is the same direction in which the waveguide tapers);*
- b) scanning (Fig. 6, #51, 52, 53, 54) light emerging from the position on the face of the waveguide onto a portion of the display (Col. 5, lines 16-32), wherein a position of the portion of the display corresponds to the position on the face of the waveguide (Fig. 2, the waveguide clearly projects the light from a particular LED onto a portion of the*

Art Unit: 2629

display corresponding to the position on the face of the waveguide at which the light emerges);

*and d) sequentially repeating steps a) - b) for one or more other light sources of the plurality of light sources, wherein each of the plurality of light sources corresponds to a different injection angle, so that different portions of the display are illuminated in turn as each light source injects light into the edge of the waveguide (Col. 5, lines 16-32).*

Irwin does not explicitly teach the step of switching off the light source.

In the same field of endeavor (i.e. backlights using light guides) Sakaguchi et al. teaches:

*c) switching off the light source (Col. 5, lines 48-53).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin with the step of switching off the light source in sequence of Sakaguchi et al., to increase the operation speed of the display (Sakaguchi et al., Col. 19, lines 23-25).

As for claim 13, Irwin teaches:

*A method according to claim 12, wherein each light source comprises one or more addressable rows of elements (Fig. 6, R, G, B diode rows, Col. 5, lines 3-8).*

As for claim 16, Irwin teaches:

*A method according to claim 13, wherein the one or more rows of elements comprises a plurality of LEDs (Col. 5, lines 3-8).*



6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Wang (US Patent # 6,704,017).

As for claim 3, Irwin teaches all the limitations of claim 2.

Irwin does not teach a cylindrical mirror.

In the same field of endeavor (i.e. backlights using light guides) Wang teaches:

*An illuminator system (Fig. 2, #20), in which light from the one or more rows of elements (Fig. 2, #23) is collimated into the edge of the waveguide (Fig. 2, #21) by a cylindrical mirror (Fig. 2, #24), (Col. 3, lines 9-14).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin with the cylindrical mirror of Wang, to reflect the light from the light elements into the light guide (Wang, Col. 3, lines 11-14).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Nauta et al. (US Publication # 2002/0030772).

As for claim 4, Irwin teaches all the limitations of claim 2.

Irwin does not teach a further waveguide.

In the same field of endeavor (i.e. backlights using light guides) Nauta et al. teaches:

*An illuminator system (Fig. 1, #8), in which light from the one or more rows of elements (Fig. 1, #12) is collimated into the edge of the waveguide (Fig. 1, #15) by a further waveguide (Fig. 1, #13), [0030].*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin with the further waveguide of Nauta et al., to ensure all light leaving the waveguide contributes to the light output of the illumination system (Nauta et al., [0030]).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Higuchi et al. (US Patent # 5,887,964).

As for claim 6, Irwin teaches all the limitations of claim 1.

Irwin does not teach a sheet for guiding the emerging light towards the normal to the display waveguide.

In the same field of endeavor (i.e. backlights using light guides) Higuchi et al. teaches:

*An illuminator system (Fig. 4), further including a film (Fig.4, #4') for guiding light emerging from the face of the waveguide towards a normal to the face of the waveguide (Fig. 4, #1), (Col. 8, lines 31-36).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin with the light guiding

sheet of Higuchi et al., to provide whiteness and softness without degrading brightness (Higuchi et al., Col. 4, lines 56-61).

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Sakaguchi et al. (US Publication # 2002/0030772) as applied to claims 12, 13, and 16 above, and further in view of Wang (US Patent # 6,704,017).

As for claim 14, Irwin teaches all the limitations of claim 13.

Irwin as modified by Sakaguchi does not teach a cylindrical mirror.

In the same field of endeavor (i.e. backlights using light guides) Wang teaches: *wherein light from the one or more rows of elements (Fig. 2, #23) is collimated into the edge of the waveguide (Fig. 2, #21) by a cylindrical mirror (Fig. 2, #24),* (Col. 3, lines 9-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin as modified by Sakaguchi with the cylindrical mirror of Wang, to reflect the light from the light elements into the light guide (Wang, Col. 3, lines 11-14).

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Sakaguchi et al. (US Publication # 2002/0030772) as applied to claims 12, 13, and 16 above, and further in view of Nauta et al. (US Publication # 2002/0030772).

As for claim 15, Irwin teaches all the limitations of claim 13.

Irwin as modified by Sakaguchi does not teach a further waveguide.

In the same field of endeavor (i.e. backlights using light guides) Nauta et al. teaches:

*wherein the light from the one or more rows of elements (Fig. 1, #12) is collimated into the edge of the waveguide (Fig. 1, #15) by a further waveguide (Fig. 1, #13), [0030].*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin as modified by Sakaguchi with the further waveguide of Nauta et al., to ensure all light leaving the waveguide contributes to the light output of the illumination system (Nauta et al., [0030]).

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin in view of Sakaguchi et al. (US Publication # 2002/0030772) as applied to claims 12, 13, and 16 above, and further in view of Higuchi et al. (US Patent # 5,887,964).

As for claim 17, Irwin teaches all the limitations of claim 12.

Irwin as modified by Sakaguchi does not teach a sheet for guiding the emerging light towards the normal to the display waveguide.

In the same field of endeavor (i.e. backlights using light guides) Higuchi et al. teaches:

*wherein the scanning further comprises guiding (Fig.4, #4') light emerging from the face of the waveguide towards a normal to the face of the waveguide (Fig. 4, #1), (Col. 8, lines 31-36).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the illuminator of Irwin as modified by Sakaguchi with the light guiding sheet of Higuchi et al., to provide whiteness and softness without degrading brightness (Higuchi et al., Col. 4, lines 56-61).

### ***Response to Arguments***

12. Applicant's arguments with respect to claims 12-17 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 01/22/2009 have been fully considered but they are not persuasive.

Applicant argues:

“Irwin clearly teaches that each optical guide 20 has a uniform thickness with respect to the direction of propagation of the light through each optical guide (see Figs. 2, 4 and 5). Instead of a tapered cross-section used for internally reflecting the light, Irwin teaches the use of the mirrored surfaces 28, 29 to reflect light in the optical guides and, consequently, teaches away from a tapered cross-section in the direction of propagation of the light. Therefore, Irwin fails to teach that the optical guides 20 have a tapered cross-section in a direction of propagation of the light.”

The Examiner disagrees with applicant's assessment. As can be best understood from the added indefinite limitation, the cross-section should be tapered in the direction of the average propagation of light within the waveguide. In this respect if one compares Fig. 1 of the instant application, with Fig. 3 of Irwin, it is clear that in both drawings, the average direction of the propagation of the light through the waveguide is from the bottom towards the top, and both waveguides taper from the bottom towards the top. Therefore the examiner does not see how the above added limitation distinguishes the claims over the prior art.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT E. CARTER III whose telephone number is (571)270-3006. The examiner can normally be reached on 9AM - 5:30PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 571-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sumati Lefkowitz/  
Supervisory Patent Examiner, Art Unit 2629

/R.E.C/